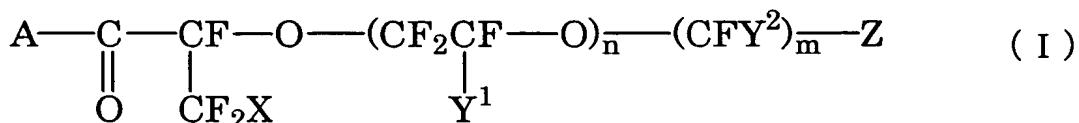
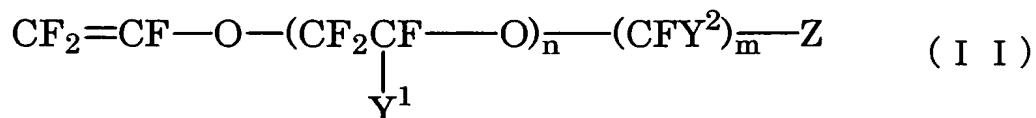


CLAIMS

1. A method for producing a water-soluble fluorine-containing vinyl ether which comprises subjecting a fluorine-containing 2-alkoxypropionic acid derivative represented by the following general formula (I):



10 (wherein A represents $-OM^1$ or $-OM^{1/2}$, and M¹ represents an alkali metal and M² represents an alkaline earth metal; X represents a halogen atom; Y¹ and Y² are the same or different and each represents a fluorine atom, a chlorine atom, a perfluoroalkyl group or a fluorochloroalkyl group; n represents an integer of 0 to 3, and n of Y¹'s may be the same or different; m represents an integer of 1 to 5, and m of Y²'s may be the same or different; and Z represents a hydrophilic group) to thermal decomposition at a temperature of not lower than 50°C but lower than 170°C in the presence of a coordinating organic solvent to give a water-soluble fluorine-containing vinyl ether represented by the following general formula (II):



(wherein Y¹, Y², Z, n and m are as defined above),
25 said coordinating organic solvent having a coordinating property with an ion of said M¹ or an ion of said M² and
said coordinating organic solvent being in an amount of 10 to 1,000 parts by mass per 100 parts by mass of said fluorine-containing 2-alkoxypropionic acid derivative.

2. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 1,
wherein the hydrophilic group is -COOM³, -OSO₃M³, -SO₃M³,
5 -O₂PM³, -OP(OM³)₂, -O₂P(OM³), -OPO(OM³)₂, -PO₂(OM³), -PO(OM³)₂,
-COOM⁴_{1/2}, -OSO₃M⁴_{1/2}, -SO₃M⁴_{1/2}, -O₂PM⁴_{1/2}, -OP(OM⁴_{1/2})₂,
-O₂P(OM⁴_{1/2}), -OPO(OM⁴_{1/2})₂, -PO₂(OM⁴_{1/2}), -PO(OM⁴_{1/2})₂, or a
10 substituted ammonio group forming a salt with a conjugate base
of an inorganic acid or fatty acid (its substituents being two
or three alkyl groups which are the same or different), wherein
M³ represents an alkali metal, a hydrogen atom or NR¹R²R³R⁴ in
which R¹, R², R³ and R⁴ are the same or different and each
represents a hydrogen atom or an alkyl group containing 1 to
4 carbon atoms, and M⁴ represents an alkaline earth metal.

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3. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 1 or 2,
wherein the thermal decomposition is carried out at a temperature not lower than 50°C but lower than 150°C.

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4. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 1, 2 or 3,
wherein the coordinating organic solvent is in an amount
of 30 to 300 parts by mass per 100 parts by mass of the
25 fluorine-containing 2-alkoxypropionic acid derivative.

5. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 1, 2, 3 or 4,

30 wherein the coordinating organic solvent comprises an aprotic polar organic solvent.

6. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 5,
35 wherein the aprotic polar organic solvent is an ether

solvent, sulfolane, hexamethylphosphoric triamide, acetonitrile, dimethylformamide, dimethyl sulfoxide, ethyl acetate and/or tetramethylurea.

5 7. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 6,
 wherein the ether solvent is a glyme-based solvent, a diethyl ether, a diisopropyl ether, tetrahydrofuran, dioxane, anisole and/or a crown ether.

10 8. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 7,
 wherein the glyme-based solvent is dimethoxyethane, diethoxyethane, monoethylene glycol dimethyl ether,
15 diethylene glycol dimethyl ether, triethylene glycol dimethyl ether, tetraethylene glycol dimethyl ether, diethylene glycol monomethyl ether and/or diethylene glycol monoethyl ether.

20 9. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 5, wherein the aprotic polar organic solvent is a glyme-based solvent.

25 10. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 5, 6, 7, 8 or 9,
 wherein the aprotic polar organic solvent has a water content not exceeding 250 ppm.

30 11. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 5,
 wherein the aprotic polar organic solvent is diethylene glycol dimethyl ether.

35 12. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 11,

wherein the diethylene glycol dimethyl ether has a water content not exceeding 250 ppm.

13. The method for producing a water-soluble
5 fluorine-containing vinyl ether according to Claim 1, 2, 3, 4,
5, 6, 7, 8, 9, 10, 11 or 12,

wherein the fluorine-containing 2-alkoxypropionic acid derivative represented by the general formula (I) has a water content not exceeding 0.1% by mass.

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14. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 1, 2, 3, 4,
5, 6, 7, 8, 9, 10, 11, 12 or 13,
wherein n is 0 or 1.

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15. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 2, 3, 4, 5,
6, 7, 8, 9, 10, 11, 12, 13 or 14,
wherein Z is $-SO_3M^3$ or $-SO_3M^4_{1/2}$.

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16. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 2, 3, 4, 5,
6, 7, 8, 9, 10, 11, 12, 13, 14 or 15,
wherein Z is $-SO_3M^3$, A is $-OM^1$ or $-OM^2_{1/2}$, Y^1 is a
25 trifluoromethyl group, Y^2 is a fluorine atom and m is 2.

17. The method for producing a water-soluble fluorine-containing vinyl ether according to Claim 16,
wherein n is 0.

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